

1 What is claimed is:

2  
3 1. A noise cancellation system having compatibility with existing socket  
4 configurations, comprising:

5 an active headset, having at least a first earphone, a first microphone, and a first  
6 gain control element that provides gain control of the first microphone;

7 a noise cancellation circuit that is located remotely from the active headset and  
8 comprises an amplifier circuit that is coupled to the first earphone of the active headset;  
9 and

10 a plurality of electrical connections having a maximum number of electrical  
11 connections for connecting the noise cancellation circuitry to the active headset that is  
12 less than the number of electric connections required in a conventional active headset.

13  
14 2. A noise cancellation system according to claim 1, wherein the active headset is a  
15 stereo headset further comprising a second earphone, a second microphone, and a  
16 second gain control element that provide gain control of the of the second microphone,  
17 and wherein the maximum number of electrical connections is seven.

18  
19 3. A noise cancellation system according to claim 1, wherein the active headset is a  
20 mono headset and wherein the maximum number of electrical connections is four.  
21

1 4. A noise cancellation system according to claim 1, wherein the active headset is a  
2 mono headset comprising a boom microphone and wherein the maximum number of  
3 electrical connections is five.  
4

5 5. A noise cancellation system according to claim 2, wherein the electrical  
6 connections comprises two stereo jack plugs.  
7

8 6. A noise cancellation system according to claim 3, wherein the electrical  
9 connections comprises two mono jack plugs.  
10

11 7. A noise cancellation system according to claim 3, wherein the electrical  
12 connections comprises a stereo jack plug.  
13

14 8. A noise cancellation system according to claim 4, wherein the electrical  
15 connections comprise a stereo jack plug and a mono jack plug.  
16

17 9. A noise cancellation system according to claim 2, wherein the electrical  
18 connections comprise a six pin connector.  
19

20 10. A noise cancellation system according to claim 3, wherein the electrical  
21 connections comprise at least one of a three pin connector and a four pin connector.  
22

1 11. A noise cancellation system according to claim 4, wherein the electrical  
2 connections comprise at least one of a four pin connector and a five pin connector.  
3

4 12. A noise cancellation system according to claim 2, wherein the electrical  
5 connections comprises a seven pin connector.  
6

7 13. A noise cancellation system according to claim 1, wherein the first microphone is  
8 coupled to a noise cancellation controller of the noise cancellation circuit at a first  
9 electrical connection of the plurality of electrical connections, the first microphone is  
10 coupled to a first voltage potential at a second electrical connection of the plurality of  
11 electrical connections, and said first microphone is coupled in parallel with said first gain  
12 control element.  
13

14 14. A noise cancellation system according to claim 1, wherein a first current source  
15 of a noise cancellation controller of the noise cancellation circuit comprises:  
16

17 a voltage source element; and

18 a bootstrapping capacitor coupled to the voltage source element and coupled to  
19 the first microphone to provide a correct bias voltage to said first microphone;  
20

21 wherein the coupling of the bootstrapping capacitor to the voltage source  
22 element causes the voltage source element to be operable as a current source within  
an operational frequency range of the active headset.

1 15. A noise cancellation system according to claim 13, wherein the gain of the first  
2 microphone is adjustable by a first adjustment element that is the first gain control  
3 element.  
4

5 16. A noise cancellation system according to claim 2, wherein the first microphone is  
6 coupled to the noise cancellation controller at a first electrical connection of the plurality  
7 of electrical connections, the first microphone is coupled to the second microphone and  
8 a first voltage potential at a second electrical connection of the plurality of electrical  
9 connections, the second microphone is coupled to the noise cancellation controller at a  
10 third electrical connection of the plurality of electrical connections, and said first and  
11 second microphones are coupled in parallel with said first gain control element.  
12

13 17. A noise cancellation system according to claim 16, wherein the first voltage  
14 potential is ground potential.  
15

16 18. A noise cancellation system according to claim 16, wherein the gain of the first  
17 microphone is adjustable by a first adjustment element that is the first gain control  
18 element and the gain of the second microphone is adjustable by a second adjustment  
19 element that is the second gain control element.  
20

21 19. A noise cancellation system according to claim 2, wherein a circuit of the active  
22 headset comprises:

1 a resistive element coupled to the first earphone and the second earphone to  
2 define a first electrical connection of the plurality of electrical connections, wherein the  
3 first earphone is coupled to a second electrical connection of the plurality of electrical  
4 connections and the second earphone is coupled to a third electrical connection of the  
5 plurality of electrical connections;

6 a capacitive element, wherein the first microphone, the second microphone, and  
7 a first terminal of the capacitive element are coupled together to define a fourth  
8 electrical connection of the plurality of electrical connections;

9 a first adjustment element coupled to the first microphone at a fifth electrical  
10 connection of the plurality of electrical connections; and

11 a second adjustment element coupled to the second microphone at a sixth  
12 electrical connection of the plurality of electrical connections,

13 wherein the adjustment elements are coupled to the resistive element.

14  
15 20. A noise cancellation system according to claim 1, wherein a circuit of the active  
16 headset comprises:

17 a resistive element coupled to the first earphone to define a first electrical  
18 connection of the plurality of electrical connections, wherein the first earphone is  
19 coupled to a second electrical connection of the plurality of electrical connections;

20 a capacitive element, wherein the first microphone, and a first terminal of the  
21 capacitive element are coupled together to define a third electrical connection of the  
22 plurality of electrical connections;

1 a first adjustment element coupled to the first microphone at a fourth electrical  
2 connection of the plurality of electrical connections; and  
3 wherein the first potentiometer is coupled to the resistive element.  
4

5 21. A noise cancellation system according to claim 2, wherein the first earphone has  
6 a first terminal and a second terminal and is characterized as having an impedance and  
7 the second earphone has a first terminal and a second terminal and is characterized as  
8 having an impedance; and

9 wherein a common contact in the amplifier circuit of the noise cancellation  
10 circuitry serves as an input connection to the first terminal of the first earphone and the  
11 first terminal of the second earphone.  
12

13 22. A noise cancellation system according to claim 21, wherein the common contact  
14 is coupled to a voltage source.  
15

16 23. A noise cancellation system according to claim 21, wherein the common contact  
17 is coupled to a voltage reference.  
18

19 24. A noise cancellation system according to claim 21, the amplifier circuit further  
20 comprising:

21 a first amplifier connected to the first earphone that amplifies signals to the first  
22 earphone;

1 a second amplifier connected to the second earphone that amplifies signals to  
2 the second earphone; and

3 a third amplifier that couples the first earphone to the second earphone and is  
4 connected to the common contact, wherein the third amplifier acts as a virtual ground  
5 for the first earphone and the second earphone.  
6

7 25. A noise cancellation system according to claim 1, the active headset further  
8 comprising:

9 a second microphone and a second gain control element that provides gain  
10 control for the second microphone.  
11

12 26. A noise cancellation system according to claim 25, wherein the noise  
13 cancellation circuitry further comprises:

14 a first bootstrapped emitter follower transistor and a second bootstrapped emitter  
15 follower transistor which behave as current sources at audio frequencies and provide a  
16 correct bias voltage simultaneously to the first microphone and second microphone,  
17 respectively, wherein the first microphone of the first earpiece has a first terminal and a  
18 second terminal and the second microphone of the second earpiece has a first terminal  
19 and a second terminal, so that a common contact serves as an input connection to the  
20 first terminal of the first microphone and the first terminal of the second microphone.  
21

22 27. A noise cancellation system according to claim 26, wherein the noise  
23 cancellation controller comprises:

1 a first current source that provides a first bias voltage to the first microphone; and  
2 a second current source that provides a second bias voltage to the first  
3 microphone.

4  
5 28. A noise cancellation system according to claim 27, wherein the first current  
6 source comprises:

7 a first emitter-follower transistor having a base provided with the first bias  
8 voltage, a collector coupled to a second voltage potential, and an emitter coupled to a  
9 first electrical connection of the plurality of electrical connections; and

10 a first bootstrapping capacitor that couples the base of the first emitter-follower  
11 transistor to the first electrical connection of the plurality of electrical connections;  
12 and wherein the second current source comprises:

13 a second emitter-follow transistor having a base provided with the second bias  
14 voltage, a collector coupled to the second voltage potential, and an emitter coupled to  
15 the third electrical connection of the plurality of electrical connections; and

16 a second bootstrapping capacitor that couples the base of the second emitter-  
17 follower transistor to the third electrical connection of the plurality of electrical  
18 connections.

19  
20 29. A noise cancellation system capable of preventing noise transients that result  
21 upon plugging and unplugging a headset according to claim 28, wherein the noise  
22 cancellation circuit has a transient detector capable of preventing noise transients that



1 result upon plugging and unplugging the active headset, wherein the transient detector  
2 comprises:

3 a window comparator; and

4 a mute logic circuit that mutes an output signal of the noise cancellation  
5 circuit received by the first earphone and the second earphone when the output signal  
6 exceeds a predetermined amplitude level.

7  
8 30. A noise cancellation system according to claim 1, wherein the noise cancellation  
9 controller comprises:

10 a first current source that provides a first bias voltage to the first microphone.

11  
12 31. A noise cancellation system according to claim 30, wherein the first current  
13 source comprises:

14 a first emitter-follower transistor having a base provided with the first bias  
15 voltage, a collector coupled to a second voltage potential, and an emitter coupled to the  
16 first electrical connection of the plurality of electrical connections; and

17 a first bootstrapping capacitor that couples the base of the first emitter-follower  
18 transistor to the first electrical connection of the plurality of electrical connections.

19  
20 32. A noise cancellation system capable of preventing noise transients that result  
21 upon plugging and unplugging a headset according to claim 31, wherein the noise  
22 cancellation circuit has a transient detector capable of preventing noise transients that

1 result upon plugging and unplugging the active headset, wherein the transient detector  
2 comprises:

3 a window comparator; and

4 a mute logic circuit that mutes an output signal of the noise cancellation  
5 circuit received by the first earphone when the output signal exceeds a predetermined  
6 amplitude level.

7  
8 33. A noise cancellation system according to claim 25, wherein the noise  
9 cancellation circuitry further comprises:

10 a first operational amplifier and a second operational amplifier which act as  
11 current sources over the operating frequency range of the active headset and also  
12 provide correct bias voltage simultaneously to the first microphone and second  
13 microphone, respectively, wherein the first microphone of the first earpiece has a first  
14 terminal and a second terminal and the second microphone of the second earpiece has  
15 a first terminal and a second terminal, so that a common contact serves as an input  
16 connection to the first terminal of the first microphone and the first terminal of the  
17 second microphone.

18  
19 34 A noise cancellation system according to claim 1, wherein the noise cancellation  
20 circuitry further comprises:

21 a first operational amplifier which acts as a current sources over the operating  
22 frequency range of the active headset and also provides a correct bias voltage to the  
23 first microphone, wherein the first microphone of the first earpiece has a first terminal

1 and a second terminal and the second microphone of the second earpiece has a first  
2 terminal and a second terminal.

3  
4 35. A noise cancellation system according to claim 1, wherein the noise cancellation  
5 circuit is integral to a passenger cabin of a vehicle.

6  
7 36. A noise cancellation system according to claim 35, wherein the noise  
8 cancellation circuit is provided in an arm rest of an aircraft seat.

9  
10 37. A noise cancellation system according to claim 36, wherein the arm rest is  
11 provided with a first stereo jack plug socket and a second stereo jack plug socket.

12  
13 38. A noise cancellation system according to claim 37, wherein the active headset  
14 has a first earpiece and a second earpiece, with the first earpiece having a first  
15 earphone and a first microphone and the second earpiece having a second earphone  
16 and a second microphone, wherein the first stereo jack plug socket provides for three  
17 input electrical connections of the plurality of electrical connections to the first  
18 microphone in the first earpiece and the second microphone in the second earpiece  
19 and the second stereo jack plug socket provides three input electrical connections to  
20 the first earphone in the first earpiece and the second earphone in the second earpiece.  
21

1 39. A noise cancellation system according to claim 1, wherein the remote noise  
2 cancellation circuit is provided in an arm rest of an aircraft seat and the arm rest is  
3 provided with a six contact socket.  
4

5 40. A noise cancellation system according to claim 1, wherein the noise cancellation  
6 circuit includes a transient detector.  
7

8 41. A noise cancellation system according to claim 1,  
9 wherein the transient detector includes a window comparator and a mute logic  
10 circuit for muting at least a first signal to at least the first earphone when the at least  
11 first signal exceeds a predetermined amplitude.  
12

13 42. A noise cancellation system according to claim 1, said active headset further  
14 comprising:  
15

16 a microphone terminal of the first microphone;

17 a headphone terminal of the first headphone at a direct current potential with  
18 respect to the microphone terminal; and  
19

20 a decoupling network operable on a signal at the headphone terminal to supply  
21 power for the first microphone and the first gain control element;

22 wherein a Wire-ORed output of the first microphone and the first gain control element is  
23 AC coupled to a microphone output terminal of the active headset.

43. A noise cancellation system, comprising:

1 an active headset, having at least a first earphone, a first microphone, and a first  
2 gain control element for controlling the gain of the first microphone;

3 a noise cancellation circuit which is contained within the active headset; and

4 a connection means having four contacts for connecting the noise cancellation  
5 circuit to the active headset, wherein the four contacts are used to power the noise  
6 cancellation circuit contained within the active headset.

7  
8 44. A noise cancellation system according to claim 43, wherein the connection  
9 means is a stereo plug and socket pair, with the stereo plug having an extended length  
10 and a contact at the end of the extended length stereo plug that is beyond the distance  
11 that a stereo plug would normally extend and with the socket having a contact  
12 operatively configured for receiving power from the contact on the stereo plug and  
13 providing power to the active circuitry.

14  
15 45. A noise cancellation system according to claim 44, wherein the stereo plug is  
16 compatible with existing socket configurations.

17  
18 46. A noise cancellation system according to claim 45, wherein the stereo plug has a  
19 plurality of contacts and a length that is switchable between a conventional stereo plug  
20 length and an extended stereo plug length and wherein the contacts of the stereo plug  
21 are reconfigured to provide power when the stereo plug is the extended stereo plug  
22 length.

1 47. A noise cancellation system having compatibility with existing socket  
2 configurations, comprising:

3 an active headset, having at least a first earphone, a first microphone, and a first  
4 gain control element for controlling a gain of the first microphone;

5 a noise cancellation circuit, at least a portion of which is contained within the  
6 active headset;

7 a plurality of electrical connections for connecting the active headset to the noise  
8 cancellation circuit wherein the electrical connections are compatible with standard  
9 audio equipment; and

10 a powering means, remote from the active headset, that provides power to the  
11 portion of the noise cancellation circuit that is contained within the active headset.

12  
13 48. A noise cancellation system according to claim 47, wherein the powering means  
14 comprises:

15 an external device having a battery and a dual-function power supply socket;

16 an active headset power plug; and

17 wherein the dual-function power supply socket is operatively configured to  
18 receive power for the external device when a power source is plugged into the dual-  
19 function power supply socket and to provide power to the noise cancellation circuit from  
20 the battery when the active headset power plug is plugged into the dual-function power  
21 supply socket.  
22

1 49. A noise cancellation system according to claim 48, wherein the battery does not  
2 supply power to the external device when a power source is plugged into the power  
3 supply socket.  
4

5 50. A noise cancellation system according to claim 47, wherein the powering means  
6 comprises:

7 an external device having a battery and a dual-function power supply socket;

8 an active headset power plug; and

9 wherein the active headset power plug has a rear power socket and is  
10 configured to provide power to the external device and the noise cancellation circuit  
11 from a power source when the power source is plugged into the rear power socket of  
12 the active headset power plug.  
13

14 51. A noise cancellation system according to claim 47, wherein the powering means  
15 comprises:

16 an external device having a battery and a line out socket;

17 an active headset power plug; and

18 wherein the line out socket is operatively configured to automatically switch to  
19 provide power to the noise cancellation circuitry from the battery when the active  
20 headset power plug is plugged into the line out socket.  
21

1 52. A noise cancellation system according to claim 51, wherein the powering means  
2 further comprises a sensing system that uses an ultrasonic test tone to determine when  
3 the line out socket is switched to provide power to the noise cancellation circuitry.  
4

5 53. A noise cancellation system according to claim 51, wherein the powering means  
6 further comprises a sensing system that monitors current drawn by the active headset  
7 to determine when the line out socket is switched to provide power to the noise  
8 cancellation circuitry.  
9

10 54. A noise cancellation system according to claim 51, wherein the powering means  
11 further comprises a sensing system within the active headset that has an application  
12 specific integrated circuit which injects a digital identification code onto a microphone  
13 signal that can be read by an external device in order to determine when the line out  
14 socket is switched to provide power to the noise cancellation circuitry.  
15

16 55. A noise cancellation system according to claim 47, wherein the powering means  
17 comprises an external device having a battery and a plurality of retractable contacts on  
18 the connection means and wherein the retractable contacts are operatively configured  
19 to provide power to the noise cancellation circuitry from the battery when an active  
20 headset is connected to the external device.  
21

22 56. A noise cancellation system according to claim 47, wherein the powering means  
23 uses phantom powering to provide power to the noise cancellation circuitry wherein the



1 presence of the active headset is sensed so that direct current is not applied to a  
2 passive headset.  
3

4 57. A noise cancellation system according to claim 56, wherein the phantom  
5 powering is disabled when a non-active headset is used.  
6

7 58. A noise cancellation system according to claim 57, wherein the powering means  
8 further comprises a sensing system that uses an ultrasonic test tone to determine when  
9 the non-active headset is used and the phantom powering is disabled.  
10

11 59. A noise cancellation system according to claim 57, wherein the powering means  
12 further comprises a sensing system that monitors current drawn by the active headset  
13 to determine when the non-active headset is used and the phantom powering is  
14 disabled.  
15

16 60. A noise cancellation system according to claim 57, wherein the powering means  
17 further comprises a sensing system within the active headset that has an application  
18 specific integrated circuit which injects a digital identification code onto a microphone  
19 signal that can be read by an external device in order to determine when the non-active  
20 headset is used and the phantom powering is disabled.  
21

1 61. A noise cancellation system according to claim 47, wherein the powering means  
2 is a superimposed positive DC voltage on a conventional analog output to provide  
3 power to the noise cancellation circuitry.  
4

5 62. A noise cancellation system according to claim 47, wherein the powering means  
6 comprises a pulse width modulator circuit that is modulated by an audio signal and that  
7 produces a square wave having a higher frequency than the desired audio frequency  
8 and a rectification and storage means,  
9

10 wherein when the active headset is plugged into the noise cancellation circuit,  
11 the square wave produced by the pulse width modulator circuit is rectified and filtered  
12 by the rectification and storage means to produce a power signal and is filtered to  
13 recover the audio signal.  
14

15 63. The noise cancellation system of claim 47, wherein the pulse width modulator  
16 circuit is disabled upon detection of a passive headset being plugged into the noise  
17 cancellation circuit.  
18

19 64. A noise cancellation system according to claim 63, wherein the powering means  
20 further comprises a sensing system that uses an ultrasonic test tone to detect when the  
21 passive headset is plugged into the noise cancellation circuit.  
22

1 65. A noise cancellation system according to claim 63, wherein the powering means  
2 further comprises a sensing system that monitors current drawn by the active headset  
3 to detect when the passive headset is plugged into the noise cancellation circuit.  
4

5 66. A noise cancellation system according to claim 63, wherein the powering means  
6 further comprises a sensing system within the active headset that has an application  
7 specific integrated circuit which injects a digital identification code onto a microphone  
8 signal that can be read by an external device in order to detect when the passive  
9 headset is plugged into the noise cancellation circuit.

10  
11 67. A noise cancellation system according to claim 47, wherein the powering means  
12 comprises an audio signal produced by an external device, wherein the volume of the  
13 audio signal is maximized and then rectified to charge an energy storage element so  
14 that the active headset is powered by the audio signal during its peaks and by the  
15 energy storage element otherwise.  
16

17 68. A noise cancellation system according to claim 67, wherein the energy storage  
18 element is a reservoir capacitor.  
19

20 69. A noise cancellation system according to claim 67, wherein the energy storage  
21 element is a battery.  
22

1 70. A noise cancellation system according to claim 67, wherein the audio signal is  
2 rectified by a diode element and the energy storage element is charged through a  
3 current limiting resistor.

4  
5 71. A noise cancellation system according to claim 67, wherein a switched-mode  
6 power supply is used to boost the audio signal level so that the energy storage element  
7 may be charged even when the voltage of the audio signal is less than the voltage of  
8 the energy storage element.

9  
10 72. A noise cancellation system according to claim 67, wherein distortion introduced  
11 by the resistance of a cable of the active headset may be reduced by a linearized  
12 charging circuit that provides a constant load impedance in order to reduce distortion of  
13 the audio signal.

14  
15  
16 73. A noise cancellation system having compatibility with existing socket  
17 configurations, comprising:

18 an active headset, having at least a first earphone, a first microphone, and a gain  
19 control element for controlling a gain of the first microphone;

20 a noise cancellation circuit, a portion of which is contained within an external  
21 device;

22 a plurality of electrical connections for connecting the active headset to the noise  
23 cancellation circuit; and

1 a powering means that provides power to the portion of the noise cancellation  
2 circuit that is contained within the external device.  
3

4 74. A noise cancellation system according to claim 73, wherein the external device is  
5 a consumer stereo equipment.  
6

7 75. A noise cancellation system according to claim 73, wherein the powering means  
8 comprises a dual-function socket of the external device, wherein when the active  
9 headset is plugged into the dual-function socket of the external device, the dual-  
10 function socket serves an auxiliary function.  
11

12 76. A noise cancellation system according to claim 75, wherein the powering means  
13 further comprises a sensing system that uses an ultrasonic test tone to determine when  
14 the dual-function socket is switched to the auxiliary function.  
15

16 77. A noise cancellation system according to claim 75, wherein the powering means  
17 further comprises a sensing system that monitors current drawn by the active headset  
18 to determine when the dual-function socket is switched to the auxiliary function.  
19

20 78. A noise cancellation system according to claim 75, wherein the powering means  
21 further comprises a sensing system within the active headset that has an application  
22 specific integrated circuit which injects a digital identification code onto a microphone

1 signal that can be read by an external device in order to determine when the dual-  
2 function socket is switched to the auxiliary function.  
3

4 79. A noise cancellation system according to claim 73, wherein the powering means  
5 comprises a pulse width modulator circuit that is modulated by an audio signal and that  
6 produces a square wave having a higher frequency than the desired audio frequency  
7 and a rectification and storage means,  
8

9 wherein when the active headset is plugged into the noise cancellation circuit,  
10 the square wave produced by the pulse width modulator circuit is rectified and filtered  
11 by the rectification and storage means to produce a power signal and is filtered to  
12 recover the audio signal, and  
13

14 wherein during a positive portion of the square wave, the first earphone and the  
15 second earphone of the active headset are disconnected and an output signal of a  
16 microphone of the active headset is simultaneously connected into the external device  
17 so that the output signal of the microphone can be measured.  
18

19 80. The noise cancellation system of claim 79, wherein the pulse width modulator  
20 circuit is disabled upon detection of a passive headset being plugged into the noise  
21 cancellation circuit.  
22

1 81. A noise cancellation system according to claim 80, wherein the powering means  
2 further comprises a sensing system that uses an ultrasonic test tone to detect when the  
3 passive headset is plugged into the noise cancellation circuit.  
4

5 82. A noise cancellation system according to claim 80, wherein the powering means  
6 further comprises a sensing system that monitors current drawn by the active headset  
7 to detect when the passive headset is plugged into the noise cancellation circuit.  
8

9 83. A noise cancellation system according to claim 80, wherein the powering means  
10 further comprises a sensing system within the active headset that has an application  
11 specific integrated circuit which injects a digital identification code onto a microphone  
12 signal that can be read by an external device in order to detect when the passive  
13 headset is plugged into the noise cancellation circuit.  
14

15 84. The noise cancellation system according to claim 73, wherein the powering  
16 means comprises superimposing an audio signal upon a positive DC voltage level to  
17 produce a resultant signal having a voltage level that is maintained at a positive voltage  
18 potential,  
19

20 wherein the audio signal is filtered out of the resultant signal to produce a DC  
21 signal that powers the portion of the noise cancellation circuit, and  
22

1 wherein a plurality of high frequency negative-going spikes are superimposed  
2 upon a drive signal and during the plurality of negative-going spikes the first earphone  
3 and the second earphone of the active headset are disconnected and an output signal  
4 of a microphone of the active headset is simultaneously connected into the external  
5 device so that the output signal of the microphone can be measured.  
6

7 85. A noise cancellation system according to claim 84, wherein the audio signal is  
8 filtered out by a resistive element and a capacitive element.  
9

10 86. A noise cancellation system according to claim 73, wherein the powering means  
11 adds a first DC offset to a first drive signal of the first earphone and the first earphone is  
12 capacitor coupled to remove the first DC offset, and  
13

14 wherein the powering means includes a bridge circuit in the external device that  
15 operates to separate a first microphone signal from the first drive signal, and  
16

17 wherein the impedance of the first earphone is measured when the active  
18 headset is plugged-in in order to enable the bridge circuit to cancel the first drive signal,  
19 leaving the first microphone signal.  
20

21 87. A noise cancellation system according to claim 86, wherein a test signal is used  
22 to measure the impedance of the first earphone and the impedance of the second  
23 earphone when the active headset is plugged-in.  
24



1 88. A noise cancellation system according to claim 73, wherein the active headset is  
2 a stereo headset further comprising a second earphone and wherein the powering  
3 means comprises:

4 a DC voltage upon which a radio frequency carrier employing a high frequency  
5 oscillator is imposed in the active headset, wherein the radio frequency carrier is  
6 modulated by a microphone output signal of a microphone and demodulated in the  
7 external device to recover the microphone output signal, the output signal of the high  
8 frequency oscillator is capacitively coupled to a drive signal of the first earphone and a  
9 drive signal of the second earphone, and the radio frequency carrier is blocked from a  
10 power source of the microphone by a radio frequency inductive element.

11  
12 89. A noise cancellation system having compatibility with existing socket  
13 configurations, comprising:

14 an active headset, having an earphone and a microphone coupled to a common  
15 ground;

16 a noise cancellation circuit, a portion of which is contained within an external  
17 device;

18 a plurality of electrical connections for connecting the active headset to the noise  
19 cancellation circuit; and

20 a powering means that provides power to the portion of the noise cancellation  
21 circuit that is contained within the external device,

22 wherein crosstalk between a earphone signal produced by the earphone and a  
23 microphone signal produced by the microphone is eliminated by placing a resistive  
24 element between the common ground and circuit ground, sensing a voltage drop across

1 the resistive element, and subtracting a proportion of the voltage drop from the  
2 microphone signal necessary to eliminate the crosstalk.

3  
4 90. A transient elimination circuit contained within a headset, comprising:

5 a first resistive element having a first terminal and a second terminal, with the  
6 first terminal coupled to a headphone common;

7 a potentiometer having a first terminal and a second terminal;

8 a decoupling capacitor having a first terminal and a second terminal, with the first  
9 terminal of the decoupling capacitor coupled to a second terminal of the first resistive  
10 element and a first terminal of the potentiometer;

11 a coupling capacitor having a first terminal and a second terminal;

12 a microphone having a first terminal and a second terminal, with the first terminal  
13 of the microphone coupled to the second terminal of the potentiometer and the first  
14 terminal of the coupling capacitor; and

15 a second resistive element having a first terminal and a second terminal, with the  
16 first terminal of the second resistive element coupled to the second terminal of coupling  
17 capacitor to form a microphone output signal and with the second terminal of the  
18 second resistive element coupled to the second terminal of the decoupling capacitor  
19 and the second terminal of the microphone to form a microphone common,

20 wherein the headphone common is at a DC voltage potential with respect to the  
21 microphone common and is filtered to provide power to the microphone, and

